

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
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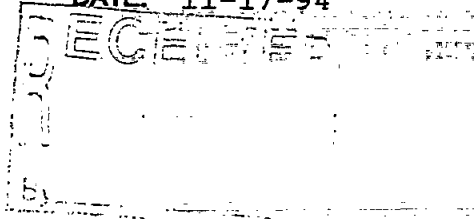
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SUBJECT: Standard Chlorine: Work Plan for
Additional Ecological Studies

FROM: Robert S. Davis, Coordinator (3HW13)
Biological Technical Assistance Group

TO: Katherine Lose, RPM (3HW42)
Delaware/Maryland Section

DATE: 11-17-94



Members of BTAG representing the Fish and Wildlife Service and EPA have reviewed the proposal and offer the comments below for your use.

BCM proposes to conduct benthic macroinvertebrate studies in Red Lion Creek as the sole method of assessing the ecological health of the system. The approach proposes to use apparent effects thresholds (AET) to determine target clean-up levels. While use of AET is justified in cases where little site-specific information is available, we believe sufficient site-specific data are available to justify the approach offered by BTAG.

We object to the proposal for the following reasons.

1. Spatial comparisons of macroinvertebrate populations and abundance within the Red Lion Creek system are unlikely to be very informative about ecosystem health. Tidal fresh water systems in the coastal plain tend to have a low diversity of macroinvertebrates. The abundance and diversity of macroinvertebrates in Red Lion Creek is also likely to have been affected by the presence of two factors in addition to the Standard Chlorine Site.

- First, the system has been altered by the installation of the tide gate.
- Second, there is a Resource Conservation and Recovery Act (RCRA) Site (Occidental Chemical) and another Superfund Site (Tybouts Corner Landfill) on Red Lion Creek.

It would be necessary to identify another tidal creek that has been altered by a tidegate and is free of chemical contamination to serve as a reference location for any benthic macroinvertebrate studies. We believe this is difficult if not impossible (see additional discussion, below, under No. 3).

2. Contamination is present in wetland areas that are rarely flooded. These areas are likely to have fewer macroinvertebrates

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and would not be comparable to areas in the main channel of the creek. A mix of wetlands/terrestrial area approach would have to be used and since something similar has already been done in the RI (chronic toxicity studies).

3. A benthic macroinvertebrate study is only one portion of the Sediment Triad Approach. These studies are most effectively performed by synoptic sampling of sediments for analysis of benthic populations, sediment chemistry, and sediment toxicity. Relying on old chemistry data to interpret the results of the population studies is likely to result in misleading conclusions. This is highly probable at the Standard Chlorine Site where chemical concentrations range over several orders of magnitude within a small area and there appears to be a very spotty distribution of contaminants. The strength of the Triad approach is that synoptic studies of chemistry, toxicity, and ecology provide regulators with an enhanced ability to identify linkages between chemical contamination and biological impacts.

The sediment triad approach requires a nearly identical stream for use as reference and this appears to be difficult if not impossible. Such a stream would have to have a tide gate in place for a sufficiently long period of time to at least reflect Red Lion Creek. Furthermore, it would have to be one where the macroinvertebrate populations are equilibrated and dependable for use in establishing biological baseline for the triad.

4. We do not agree with the designation of areas having less than 5 ppm chlorinated benzene as having background concentrations. In one of the bioassay tests reported in the Remedial Investigation there was a statistically significant increase in mortality in the amphipod, Hyalella azteca, exposed to sediments containing 0.17 ppm chlorinated benzene.

5. The proposed study will provide no information on possible bioaccumulation of chlorinated benzene into the tissues of fish and other vertebrates. We note that bioaccumulation into fish tissues was determined during the RI and recommends that fish tissue monitoring be conducted as part of the ecological monitoring of the site remediation.

Conclusions:

- Use of AET is unjustified in light of the site-specific data available.
- Data in Appendix K of the RI shows that toxicity is demonstrated at levels as low as 0.17 ppm, a value 1/6 that of AET.
- AET is not applicable to terrestrial areas.
- Background areas for ecological risk assessment cannot show levels of contamination that are attributable to the site or at levels that indicate toxicity.

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- The sediment triad approach is not suitable to this site and its aquatic ecosystem.

- Bioaccumulation is and will remain an important part of future ecological characterization and risk assessment due to the bioaccumulative qualities of the contaminants from the Standard Chlorine Site.

Recommendation:

Proceed with the ROD and include a monitoring program as outline in prior BTAG memos.

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